

Remarks:

Reconsideration of the application, as amended herein, is respectfully requested.

Claims 1 - 12 and 14 - 20 are presently pending in the application. Claims 1 - 4 and 14 - 19 are subject to examination and claims 5 - 12 and 20 have been withdrawn from examination. Claims 1 and 16 have been amended. Claim 13 was previously canceled.

On page 2 of the above-identified Office Action, claim 16 was objected to because of an informalities. The Examiner's suggested correction has been made.

Additionally on page 2 of the Office Action, claims 1, 2 and 14 - 19 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U. S. Patent No. 6,323,509 to Kusunoki ("KUSUNOKI"). On page 4 of the Office Action, claims 1 - 4 and 14 - 19 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U. S. Patent No. 4,689,647 to Nakagawa et al ("NAKAGAWA").

Applicants respectfully traverse the above rejections, as applied to the amended claims.

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More particularly, claim 1 has been amended herein to recite,
among other limitations:

a distance between a point located at the center of the IGBT and said emitter short region being maximized so that the IGBT is triggered at the lowest possible current.

The maximizing of the distance between the emitter short and the center of the IGBT for the purpose of triggering the IGBT with the lowest possible current, as claimed, is described on page 14, lines 12 - 23 of the instant application, which states:

Fig. 3A shows a point X located at the center of the device. The horizontal bulk resistance R_h from the point X to the emitter short region 39 is significantly larger compared with the known IGBT described in the introduction with reference to Fig. 2. As the forward voltage rises, the IGBT triggering voltage U_v of 0.7 V is first reached at the point X, the current/voltage characteristic of the device snapping back from the MOS characteristic to the IGBT characteristic (snapback point in accordance with Figs. 5A and 5B). The distance between the point X and the emitter short region 39 should be particularly large in order that triggering is effected at the lowest possible current. [emphasis added by Applicants]

Further, page 19 of the instant application, lines 4 - 9, states:

Fig. 4C shows a further exemplary embodiment 40c of an IGBT according to the invention with a single punctiform n-type emitter short region 49c below the high-voltage edge 41c. The distance and thus the bulk resistance R_h with respect to the point X are maximized by this singular arrangement of the emitter

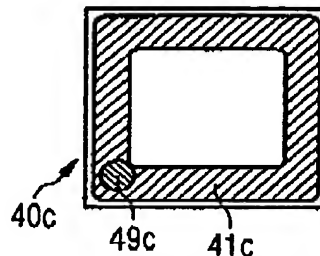
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short region 49c in a corner of the chip. [emphasis added by Applicants]

This arrangement is additionally shown in Fig. 4C of the instant application, reproduced herebelow for convenience.

FIG 4C

Maximizing the distance between the short and the center of the IGBT, causes the IGBTs to trigger at the lowest possible current, whereby the bulk resistance R_h to the point X is maximized and the snapback effect is as low as possible. This is additionally supported in the instant application on page 15, lines 20-25, which states:

An IGBT with a field stop is taken as a basis, and the thin solid forward characteristic shows that the snapback effect becomes smaller, the larger the short distance, that is to say the distance between the emitter short region 39 and the point X (cf. Figs. 3A, 3B and also Figs. 4A - 4C, yet to be explained).
[emphasis added by Applicants]

Neither the KUSUNOKI reference, nor NAKAGAWA, alone or in combination, teach or suggest Applicants' particularly claimed invention, including, among other limitations, a distance between a point located at the center of the IGBT and the

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emitter short region being maximized for triggering the IGBT
at a lowest possible current.

It is accordingly believed that none of the references,
whether taken alone or in any combination, teach or suggest
the features of claim 1. Claim 1 is, therefore, believed to
be patentable over the art. The dependent claims are believed
to be patentable as well because they all are ultimately
dependent on claim 1. As it is believed that the claims were
patentable over the cited art in their original form, the
claims have not been amended to overcome the references.

In view of the foregoing, reconsideration and allowance of
claims 1 - 12 and 14 - 20 are solicited.

In the event the Examiner should still find any of the claims
to be unpatentable, counsel would appreciate receiving a
telephone call so that, if possible, patentable language can
be worked out. In the alternative, the entry of the amendment
is requested, as it is believed to place the application in
better condition for appeal, without requiring extension of
the field of search.

If an extension of time for this paper is required, petition
for extension is herewith made.

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Please charge any fees that might be due with respect to
Sections 1.16 and 1.17 to the Deposit Account of Lerner and
Greenberg, P.A., No. 12-1099.

Respectfully submitted,


For Applicants

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